



REVIEW OF TRANSPORTATION PLANS AND PRIOR STUDIES

APRIL 2012

Prepared for:

Maine Department
of Transportation



Maine Turnpike Authority



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OVERVIEW

This memorandum summarizes the findings of prior transportation studies that are relevant to the Central York County Connections Study (CYCCS). While the primary focus of this effort is review of studies that have been conducted within the area that corresponds to the CYCCS study area, a broad range of regional and state-wide planning documents were reviewed as well. The studies reviewed, with a few exceptions, were prepared by the Maine Department of Transportation (MaineDOT), Maine Turnpike Authority (MTA), or Southern Maine Regional Planning Council (SMRPC). Together with the *Review of Local Plans and Development Regulations Technical Memo* (tech memo I-2a), this memo forms a background of information to inform the Central York County Connections Study (CYCCS) process.

The primary objective of this review is to identify aspects of prior work that are of interest to the CYCCS study, including findings related to transportation conditions within the study area, past study recommendations and subsequent actions, and policy directives of relevance in regional and State planning documents.

PRIOR RECOMMENDATIONS OF RELEVANCE

Tables 1 through 3 summarize past recommendations that are of specific relevance to the CYCCS (i.e. - those that have the potential to affect connections between central York County and the coastal transportation corridors). These are further detailed along with other study findings in this memo.

Those prior recommendations that have been addressed by implemented projects are shown in Table 1. Table 2 lists the project-specific recommendations that have not been implemented as of 2012. More general recommendations not involving specific project actions are compiled in Table 3.

Table 1: Prior Recommendations Addressed by Implemented Projects

Recommendation	Location	Study	Notes
Improve Exit 32/Rte 111 intersection	Biddeford	State Route 111 Corridor Study (2003)	Intersection has been expanded to include additional turn lanes and traffic signal upgrades.
Improve intersection of Rte 111/Rte 35	Lyman	State Route 111 Corridor Study (2003)	Left turn lanes and access management improvements constructed.
Improve intersection of Rte 111/US 202/Rte 4	Alfred	State Route 111 Corridor Study (2003)	Left turn lanes and access management improvements constructed.
Improve visibility of traffic signals on Route 111 (mitigate sun glare).	Entire Route 111	State Route 111 Corridor Study (2003)	Added additional traffic signal head on the right side of signal poles.
Improve intersection of US 202/Rte 224/Grammar R	Biddeford	State Route 111 Corridor Study (2003)	Added left turn lane and improved alignment.
Expand Route 111 in Biddeford area (two through lanes each direction)	Biddeford	State Route 111 Corridor Study (2003)	Route 111 has been expanded to four lanes plus center turn lane in Biddeford.
Improve intersection of Route 111/Hill Road.	Arundel	State Route 111 Corridor Study (2003)	Project underway – expected completion in December 2012.
Improve intersection of Route 111/New Road/Old Alfred Road.	Arundel	State Route 111 Corridor Study (2003)	Project underway – expected completion in December 2013.
Construct passing lanes on Route 111 (Westbound from Old Alfred Rd to Drew's Mill Rd)	Alfred – Biddeford	State Route 111 Corridor Study (2003)	Project underway – expected completion in August 2013.

Table 2 Prior Recommendations – Not Implemented (as of March 2012)

Recommendation	Location	Study	Status
Construct local bypass around Ogunquit Village and/or widen Route 1 to six lane section.	Ogunquit	U.S. Route 1 Corridor Traffic Analysis (1993)	<ul style="list-style-type: none"> Not implemented, in-part due to lack of local support. Local bypass of Ogunquit of possible relevance to CYCCS if linked to other new corridor or interchange improvements.
Construct passing lanes on Route 111	Alfred – Biddeford	State Route 111 Corridor Study (2003)	<ul style="list-style-type: none"> Construction of multilane divided highway in Biddeford negates need for passing lanes in Biddeford. One westbound lane programmed for construction in 2013 (see Table 1). Other locations not yet implemented.
Improve intersection of Route 111/Saco Road/School St.	Alfred	State Route 111 Corridor Study (2003)	<ul style="list-style-type: none"> No improvements programmed, though nearby intersection improvements at Kennebunk Road (new traffic signal) to be constructed in 2012.



Table 3 General Recommendations and Issues Identified for Further Study (Not Project-specific)

Recommendation	Location	Study	Notes
Apply access management principles to reduce size and frequency of curbcuts.	Ogunquit	Route 1 Corridor Traffic Study (2003)	
Investigate interchange possibilities on Maine Turnpike	Ogunquit	U.S. Route 1 Corridor Traffic Analysis (1993)	<ul style="list-style-type: none"> • Preliminary investigation was conducted in 1993 Route 1 study. • Ranked as priority #1 by SMRPC Coalition.
Investigate opportunities to enhance Wells Transportation Center	Wells	SMRPC Rte 1 Corridor Coalition	<ul style="list-style-type: none"> • Ranked as priority #3.
Analyze need for road upgrades or capacity improvements for routes connecting to Route 1	Wells, Ogunquit	SMRPC Rte 1 Corridor Coalition	<ul style="list-style-type: none"> • Ranked as priority #6 (tied).
Work with towns to improve bike and pedestrian accommodations	Wells, Ogunquit	SMRPC Rte 1 Corridor Coalition	<ul style="list-style-type: none"> • Ranked as priority #6 (tied).
Investigate traffic signal and traffic management improvements	Wells, Ogunquit	SMRPC Rte 1 Corridor Coalition	<ul style="list-style-type: none"> • Ranked as priority #7.
Investigate creative land use and access management strategies	Wells, Ogunquit	SMRPC Rte 1 Corridor Coalition	<ul style="list-style-type: none"> • Ranked as priority #11.
Investigate potential to expand TDM programs	Wells, Ogunquit	SMRPC Rte 1 Corridor Coalition	<ul style="list-style-type: none"> • Ranked as priority #12.
Design and implement a consistent curb cut permitting process for Route 109	Sanford, Wells	SMRPC Rte 109 Committee	
Improve access management on Rte 109 between Sam Hill Rd (Sanford) and Lindsay Rd (Wells)	Sanford, Wells	SMRPC Rte 109 Committee	<ul style="list-style-type: none"> • Identified as most critical access management segment by committee.
Study access management, development potential, and traffic operations on Rte 109 in the High Pines area.	Wells	SMRPC Rte 109 Committee	
Examine setbacks and frontages	Sanford, Wells	SMRPC Rte 109 Committee	<ul style="list-style-type: none"> • Part of suggested study of access management.
Develop a Route 109 Mobility Plan	Sanford, Wells	SMRPC Rte 109 Committee	<ul style="list-style-type: none"> • Covering access management, mobility and safety.
Determine if mobility sight distance is a goal, and if so, make non-waiverable. Evaluate other waiverable permit requirements as well.	Sanford, Wells	SMRPC Rte 109 Committee	

Recommendation	Location	Study	Notes
Consider a bypass around High Pine area	Wells	SMRPC Rte 109 Committee	
Address horizontal and vertical alignment between High Pine and Sam Allen Rd if cost-benefit favorable	Sanford, Wells	SMRPC Rte 109 Committee	
Consider higher standard of access management (minimum driveway spacing and sight distance)	Sanford, Wells	SMRPC Rte 109 Committee	
Conduct alternatives analysis for east-west transportation from the Maine Turnpike to the Sanford area	York Co	Connecting Maine – Long Range Transportation Plan (2010)	<ul style="list-style-type: none"> • Being studied in the Central York County Connections Study.
Study bypass around North Berwick center	North Berwick	Connecting Maine – Long Range Transportation Plan (2010)	
Investigate negative easement, rights-of-way and access rights purchases on Route 4 and US 202 (and elsewhere).	York Co	Connecting Maine – Long Range Transportation Plan (2010)	
Develop a Park and Ride Lot in Sanford	Sanford	Connecting Maine – Long Range Transportation Plan (2010)	
Establish transit service between Sanford/Biddeford	York Co	Connecting Maine – Long Range Transportation Plan (2010)	
Expand Biddeford Exit 32 park and ride	Biddeford	Maine Turnpike 10-Year Planning Report (2009)	
Investigate transit service to Portland Naval Shipyard	York Co	<ul style="list-style-type: none"> • Maine Turnpike 10-Year Planning Report (2009) • Maine's Park and Ride Lots (2004) 	



STUDIES AND REPORTS REVIEWED

Distinct corridor study efforts have been conducted for three corridors in the CYCCS study area – Routes 1, 109 and 111 – over the past decade (with an additional study of Route 1 in 1993):

- U.S. Route 1 Corridor Traffic Analysis (MaineDOT, 1993)
- Route 1 Corridor Traffic Study (MaineDOT, 2005)
- Route 1 Corridor Coalition (SMRPC, 2006-07)
- Route 109 Corridor Committee (SMRPC, 2004)
- State Route 111 Corridor Study (MaineDOT, 2003)

Additional studies and planning documents of potential relevance to the CYCCS Study were reviewed as well. These documents are summarized in subsequent sections of this memo, and include:

MaineDOT Plans

- Connecting Maine – Statewide Long Range Transportation Plan 2008-2030 (2010)
- Connecting Maine – Multimodal Six-Year Transportation Capital Improvement Program FY 2010-2015 (2009)
- Fiscal Years 2010-2011 Work Plan (2009 Update)
- Maine Integrated Freight Plan (2002)
- Moving People and Goods; the Governor’s Rail and Freight Investment Plan (2009)

Maine Turnpike Authority Reports

- Maine’s Park and Ride Lots; Evaluating and Strengthening the System (MTA/MaineDOT, 2004)
- Maine’s Park and Ride Lots; System Update (MTA/MaineDOT, 2007)
- Maine Turnpike 10-Year Planning Report 2009-2018 (2009)
- Maine Turnpike Authority 2007 Annual Report of Operation and Maintenance (2007)
- Maine Turnpike Authority 2009 Annual Report (2009)
- 2010 Origin Destination Survey Summary Report (2010)
- York Toll Plaza Replacement Study (MTA, 2008)

Other Studies of Interest

- Study of Impacts Caused by Exempting Currently Non-Exempted Maine Interstate Highways from Federal Truck Weight Limits (MaineDOT, 2004)
- Study of Impacts Caused by Exempting the Maine Turnpike and New Hampshire Turnpike from Federal Truck Weight Limits (MaineDOT, 2004)
- Route 236 Corridor Committee (SMRPC, 2007)
- Transportation Impacts of Smart Growth Development in Maine (University of Vermont Transportation Research Center, 2009)

PRIOR CORRIDOR STUDIES WITHIN THE CYCCS STUDY AREA

U.S. ROUTE 1 CORRIDOR

U.S. ROUTE 1 CORRIDOR TRAFFIC ANALYSIS (1993)

A 1993 MaineDOT study evaluated Route 1 from the I-95 Connector in York Village to Route 109 in Wells. While the study did not focus on improving connections between central York County and the coast, some elements are of potential interest to the CYCCS. The study considered a new Turnpike interchange in the Ogunquit area, but concluded that further investigation would be needed to fully evaluate its feasibility and effectiveness. Adverse effects on local traffic conditions in Ogunquit were identified as an issue of concern, but the study noted that potential mitigating solutions – such as also establishing a bypass route to reduce traffic impacts on the village area – were not considered.

Large capital projects recommended by the study have not been implemented, due in part to concerns about impacts to properties and community character, and a lack of consensus regarding their need and effectiveness.

Scope of Study

- Issued March 1993 by MaineDOT.
- Where (study limits/area) – York, Ogunquit, Wells. Route 1 (Wells-Ogunquit) from the I-95 Connector near York Village to State Route 9/109 in Wells.
- Time Horizon –1988 base year volumes projected to 2010.

Applicable Findings

Demographics/Projections

- Study projected 4% to 5% population growth per year to 2010 for Kennebunk and Kennebunkport.
- Less than 1% per year population increases projected for Ogunquit and Ogunquit Beach areas.

Land Use/Zoning/Access Management

- No relevant discussion.

Travel Forecasts

- Observed growth in daily traffic from 1975 to 1987 ranged from 2.9% per year in Wells south of State Route 109 to 5.4% per year in York near Route 1A.
- Study forecast that daily traffic on Route 1 would grow by 3% annually through 2010.

Traffic Operations and Safety

- Nine intersections were identified as operating at LOS E or F (5 of which were due to minor approach delays).
- Route 1 segment between Shore Road and Kimballs Lane reported at LOS E.
- July and August volumes identified as being 87% higher than average month on Route 1 in Ogunquit.
- Future (2010) LOS of E or F reported at 16 locations analyzed.
- Suggested mainline widening to 6 lanes (this was not implemented).

Freight

- No relevant discussion.



Transit

- No relevant discussion.

Parking

- No relevant discussion.

Nonmotorized

- No relevant discussion.

Other

- An origin-destination survey was conducted, which generally indicated the following as having high shares of trips:
 - From the northern end of the study area destined to shore areas north of Ogunquit (Wells and Moody Beach areas).
 - From the southern end of the study area destined to Ogunquit beach areas.
 - Through trips found at both study area cordons.

Study Recommendations

Study recommendations included:

- Construction of a local Bypass around Ogunquit Village from Bourne Lane to Tatnic Road and/or upgrade/widening of Route 1.
- A new interchange on I-95 was investigated, to be constructed at Bourne Lane (viewed as most effective to relieve Route 1 traffic) or at Tatnic Road (less effective and negative results in some areas). Further study was suggested.
- Widening (additional lanes and turn lanes) were recommended for several locations.

Additional Observations by Reviewer

- Most of the recommended capacity expansion improvements were not implemented.
- Based on data presented in the 2005 study (reviewed below), it appears that the rate of actual traffic growth was lower than projected by the 1993 study.

ROUTE 1 CORRIDOR TRAFFIC STUDY (2005)

This study, conducted by MaineDOT in 2005, evaluated Route 1 in Ogunquit. The study generated recommendations for a consistent highway cross section through Ogunquit, improved pedestrian facilities, and a roundabout on Route 1 in the Ogunquit town center (at the intersection with Shore Road and Beach Road).

Scope of Study

- Issued May 2005 by Maine DOT.
- Where (study limits/area) – Ogunquit. US Route 1 from York/Ogunquit Town line to Ogunquit/Wells Town line.
- Time Horizon –2003 Base year, 2023 Forecast Year.

Applicable Findings

Demographics/Projections

- No relevant discussion.

Land Use/Zoning/Access Management

- No relevant discussion.

Travel Forecasts

- Historical traffic growth over the prior 38 years showed an increase of roughly 250 vehicles per year until 1999, at which time growth leveled off for three years and then declined in 2003.
- Future traffic volumes were projected to grow by 30% over 20 years (1.5% per year).

Traffic Operations and Safety

- Average Annual Daily Traffic (AADT) was 14,550 vehicles per day, with seasonal peaks to 23,300 vehicles per day in July and August (38% of Annual traffic occurs in summer months).
- Traffic volumes on Saturdays were reported as being 5% higher than typical weekday volumes.
- The daily travel patterns indicated a strong presence of non-commute related trips, as volumes steadily rise then remain at near peak levels (about 1,600 vehicles per hour) for 8 hours during summer months.
- Travel lanes are typically 9 to 10 feet with a 9 foot center left turn lane.
- Two High Crash Locations (Route 1 at Shore Road/Beach Road and Route 1 at Berwick Road) were identified.
- Route 1 crash rates were reported as being greater than the statewide average (163 .47 vs. 115.8).
- Rear end/sideswipe, pedestrian, and sled/bike crash rates were noted as being higher than the statewide average crash rates.
- Higher crash incidence was observed during summer months.
- Slow northbound travel speeds on Route 1 reported for summer months; 4 to 8 mph typical. Delays in excess of 5 minutes at Shore Road and Beach Road.
- Existing Level of Service (LOS) F reported at Shore Road and Beach Road, and LOS D at Berwick Road.
- Queues (or back-ups) were identified as spilling back into Bourne Lane, Obeds Lane and Agamenticus Road and School Street intersections.
- Signal Warrant analysis shows warrant for Route 1 at Shore Road and Beach Road.
- Future LOS assessed at various locations, with congestion indicated by LOS F at Shore Road and Beach Road, LOS F at Berwick Road, and LOS E at Bourne Lane.

Freight

- No relevant discussion.

Transit

- Ogunquit Trolley Company LLC identified as providing eight trolleys June through Labor Day and four in the spring and fall (ridership is 250,000 persons per season).
- Trolleys operate along a loop from Ogunquit and Wells Town line to Ogunquit Beach and Perkins Cove then back to Ogunquit Beach before returning to the Ogunquit/Wells town line.
- Trolleys run every 5 minutes in summer and every 15 minutes in spring and fall.

Parking

- No relevant discussion.

Nonmotorized

- Concentrations of pedestrian activity identified at Shore Road and Beach Road and Berwick Road.



- Report notes that sidewalks were provided along most of corridor on at least one side; worn paths were noticed where sidewalks were not present.
- Route 1 does not have designated bicycle facilities. Report noted that bicyclists commonly travel Route 1 during summer months.
- MaineDOT completed a project to provide a 5 foot paved shoulder on Route 1 in Wells from the Ogunquit town line to the southern junction of Route 9.
- Paved shoulders for cyclists are also provided on Route 1 in York south of Ogunquit.

Study Recommendations

The study recommendations are generally not directly relevant to the CYCCS, but are listed below to provide context and examples of actions that have been considered elsewhere in the region.

- Construction of a Roundabout at Route 1 and Shore Road and Beach Road intersection in Ogunquit town center. This recommendation has not been implemented due to a lack of consensus regarding its effectiveness and potential impacts to the town center.
- Widen Route 1 as necessary to provide 5 feet or greater paved shoulders on both sides of Route 1 in Ogunquit.
- Provide continuous sidewalks along the east side of Route 1 from the Ogunquit Play House to the Wells town line and along the west side from Agamenticus Road to the Wells town line.
- Consider an extension of one or more sidewalks into Wells.
- Widen Route 1 in Ogunquit within the limits of the existing right-of-way (generally 66 feet) to provide a 12 foot center two way left turn lane, two 11 foot through lanes, two 5 foot curbed shoulders, and two 5 foot sidewalks (54 foot cross section).
- Apply access management principles to improve safety by reducing the size and number of curb cuts where feasible.

SMRPC ROUTE 1 CORRIDOR COALITION (2006-07)

The SMRPC convened a *Route 1 Corridor Committee* comprised of public and private sector members interested in Route 1 from Kittery to Biddeford. The group was active in 2006-07, documenting existing transportation conditions within the corridor and identifying several priorities for further study. Investigating additional interchange possibilities along the Maine Turnpike was identified as the top priority. A new interchange could potentially affect access to central York County – either directly or indirectly by changing traffic patterns and congestion – depending on the location and connections to area highways. The committee also recommended investigating opportunities to enhance the Wells Transportation Center's role as an intermodal center. Specific recommendations were not identified, but enhancements could potentially benefit travelers from central York County as well. Other identified priorities included improving bicycling and walking, traffic management, and land use/access management strategies.

Scope of Study

- A packet of transportation data and information compiled by SMRPC in April 2006 and a Route 1 Action Plan were prepared.

- Where (study limits/area) –Route 1 from Portsmouth, NH/Kittery, ME town Line to Precourt Street in Biddeford.
- Time Horizon – Varied: Crash data 1997-2004; AADT 2000-2004; Summer counts 2005; Interchange and Toll AADT 1995 and 2005; Ridership projections 2007-2012.

Applicable Findings

Demographics/Projections

- No relevant discussion.

Land Use/Zoning/Access Management

- No relevant discussion.

Travel Forecasts

- No relevant discussion.

Traffic Operations and Safety

The Data Packet presents several items, including:

- Maps highlighting fatalities, serious injuries, bike and pedestrian crashes. Data shows concentrations of pedestrian and bike crashes in developed areas, especially in Wells and Ogunquit.
- A table shows Critical Rate Factor (comparison of crash rates to statewide average for similar segment types) by segment. Nine segments were identified as being among the 100 highest (worst) Critical Rate Factor scores in the state, including three within the CYCCS study area: Main Street at Thompson in Kennebunk, Route 1 at Buzzell Road and Route 1 at Chapel Road in Wells.
- Traffic volume data at many locations including map of AADT for 2003.
- Table of route mileage by town; Functional Class mileage by town; speed limits by town.
- Map of speed limits.
- Table of I-95 interchange AADT and growth rate from 1995 to 2005 (ranges from 0-5% annually).
- Table of I-95 Mainline AADT and growth rate from 1995-2005 (about 2.5% per year).

Freight

- No relevant discussion.

Transit

- Steady moderate growth in ridership projected for 5 years.

Parking

- No relevant discussion.

Nonmotorized

- No relevant discussion.

Study Recommendations

The Coalition developed an extensive prioritized action plan. Items of particular interest to the CYCCS (priority noted in parenthesis) include:

- Investigate interchange possibilities along the Maine Turnpike was identified as the top priority.
- Investigate opportunities to enhance the Wells Transportation Center (#3).
- Investigate opportunities to locate satellite parking lots served by the Shoreline Explorer (#4).



- Analyze need for road upgrades or capacity improvements for routes connecting to Route 1 (tied for #6).
- Work with towns to improve bike and pedestrian needs (tied for #6).
- Investigate traffic signal and traffic management improvements (#7).
- Investigate creative land use standards and strengthen access management strategies (#11).
- Investigate potential to expand GoMaine program elements that are supportive of the Route 1 corridor (#12).

ROUTE 109 CORRIDOR

SMRPC ROUTE 109 CORRIDOR COMMITTEE (2004)

SMRPC organized the *Route 109 Corridor Committee* in 2004. This group considered many transportation issues along Route 109 in Sanford and Wells, but particularly focused on addressing safety through access management and improving sight distance. The study was longer-term in nature, identifying issues for further study rather than project-ready recommendations. Recommendations included investigation of options to bypass the High Pine neighborhood, development of a consistent access management program for the corridor, consideration of access needs for undeveloped parcels, and further evaluation of horizontal and vertical alignment.

Further study or action on the issues identified has yet to occur. However, Route 109 is currently being rehabilitated from near the interchange with the Maine Turnpike to near the Sanford/Wells town line. These improvements will widen shoulders and improve sight distance by clearing roadside vegetation.

Scope of Study

- An Interim Report was completed June 2004 by SMRPC for the Route 109 Corridor Committee, which included representatives from Sanford and Wells.
- Where (study limits/area) – Sanford and Wells. Route 109 between Old Mill Road in Sanford and Route 1 in Wells.
- Time Horizon – Typically current data at the time; 2003-2004.

Applicable Findings

Demographics/Projections

- Daily traffic volumes were identified as growing from 2% to 3% per year.
- Planned developments in Wells adjacent to Maine Turnpike were identified, including hotel, gas, fast food and drive through donut shop. Also plans in Wells for 150 acres of industrial use (Pine Tree zone).
- Planned developments in Sanford were identified, including new street connections (map provided). Appears there will be additional street network, limiting of front access, and additional rear and shared access.
- Potential for “big-box” developers between Route 4 and Route 99.

Land Use/Zoning/Access Management

- Route 109 Zoning Base Map depicting uniform zoning districts (themes based on existing land use ordinances in each town) were developed and used to generalize traffic generation potential along corridor.
- Report provides a table of minimum lot sizes and setbacks by use based on town comp plans. Used to assess where traffic generation would occur and amount of land reserved for potential widening.
- Conducted evaluation of highway access regulations including setbacks, sight distance, spacing and corner clearance, and future accesses by Maine DOT, Sanford and Wells. Identified synergies and conflicts. Map highlights key problem areas.

Travel Forecasts

- 2003 AADT approximately 23,000 vehicles Near Old Mill Road; 2002 AADT 18,610 vehicles east of Maine Turnpike Exit 19; 2002 AADT 8,070 between Meetinghouse Road and Bald Hill Road.
- AADT per year growth ranging from 2.0% to 3%.

Traffic Operations and Safety

- Nine high crash locations identified (these have more than 8 crashes over a three-year period and a Critical Rate Factor greater than 1.0), six of which are between Old Mill Road and Route 4.
- High speed locations between Old Mill Road and Route 4 (up to 35.5mph including delay).
- LOS problem areas (existing/projected) were identified as:
 - Route 9 to Evergreen D/ E.
 - Evergreen to High Pine Loop D/D.
 - High Pine Loop to Route 99 D/D.
 - Route 4 to Old Mill Road D/NA.

Freight

- Planned increase in industrial and retail uses in area projected to increase truck usage.

Transit

- Brief discussion of WAVE bus service is provided.
- Expanding "Coastal Explorer" route to Sanford via Route 109 and Route 111 was suggested for further consideration.
- Suggested use of the Wells Intermodal Transportation Center for carpooling and access to passenger rail.

Parking

- Suggested investigating establishment of a Park and Ride lot(s) in Sanford.

Nonmotorized

- Eastern Trail will have a major entry point on Route 109 one mile from Wells Intermodal Transportation Center.

Study Recommendations

Actions recommended by the committee include:



- Collectively design and implement a consistent curb cut permitting process throughout the corridor. This has yet to occur, and would require a collaborative effort on the part of Sanford, Wells, MaineDOT, and likely SMRPC to develop and adopt the proposed standards.
- The committee identified the corridor segment between Sam Hill Road in Sanford and Lindsay Road in Wells as most critical in terms of need for access management.
- Several recommendations for further study in the High Pine area were made:
 - Evaluate potential access impacts of undeveloped or subdividable lands.
 - Study how this area affects the greater transportation functions of Route 109.
 - Work with Maine DOT and land owners to increase mobility in the High Pine area as needed.
- Examine study area setbacks and frontages of structures and lots in study area.
- Jointly evaluate if mobility sight distance is a goal, if so make it non-waiverable.
- Evaluate waiverable regulations to determine if permitting requirements should be stronger and less flexible.
- Reexamine high traffic generating land uses that will impact highway mobility and safety and consider enforcing a higher standard of access management regulations (including minimum spacing and sight distance).
- Consider adopting Maine DOT's "Change of Use" access management permitting definition to increase mobility and safety for existing nonconforming sites.
- Address horizontal and vertical realignments between High Pine Area and Sam Allen road if cost benefit is reasonable.
- Develop a Route 109 Mobility Plan and/or adopt a consistent set of access management rules to improve mobility, safety and preserve ROW.
- Consider a bypass around High Pine.

Additional Observations by Reviewer

- Interim report appears to mainly be a collection of committee input and ideas based on available comprehensive plans and regulations. Recommendations are geared to further study and agreement by stakeholders.

ROUTE 111 CORRIDOR

STATE ROUTE 111 CORRIDOR STUDY (2003)

MaineDOT conducted a study of the Route 111 corridor in 2003, which included Route 111 between Alfred and Biddeford and Route 202 between Sanford and Alfred. The study identified congestion and safety related issues in the corridor. The study recommends several improvements, which are classified as short-term (high, medium, or low priority) or longer-term projects.

In total, nearly all of the specific project recommendations identified in the 2003 study have or will soon be implemented by MaineDOT. The CYCCS will update and evaluate corridor conditions to assess how the corridor is performing with these upgrades and identify additional issues that may have developed since the study was completed.

Scope of Study

- December 2003 by Maine DOT with participation by Biddeford, Arundel, Lyman, Alfred, and Sanford.
- Where (study limits/area) – Route 111 between Biddeford and Sanford (13.88 miles of Route 111 from I-95 Exit 4 to Route 4A/202 and Route 224).
- Time Horizon – evaluate existing and future (2022) deficiencies and potential improvements.

Applicable Findings

Demographics/Projections

- No relevant discussion.

Land Use/Zoning/Access Management

- No relevant discussion.

Travel Forecasts

- Growth forecasts of 4% per year to 2022 (80% growth in 20 years) from Exit 4/Precourt St to Biddeford and Arundel town line.
- Growth forecasts of 2.5% per year to 2022 (50% growth in 20 years) from Biddeford and Arundel Town Line to Route 202/4A in Sanford.

Traffic Operations and Safety

- Directional distribution is 70% eastbound/30% westbound during the AM, and 36% eastbound/64% westbound during the PM peak periods.
- Report identified several areas with design speed less than posted speed limit for stopping sight distance (Arundel, Lyman, and Alfred).
- One High Crash location was identified; Exit 4/Precourt Street in Biddeford.
- Report noted that the study area fatal crash rate was much high than state average for Principal Arterial Two Lane Rural (4.21 vs. 0.45).
- Overall study area crash rate was reported as being below statewide average, however.
- Overrepresented crash types (relative to statewide rates for similar highways) were identified as rear end/sideswipe, head on/ sideswipe, intersection movement, animal (moose) and other crashes.
- Overrepresented crash contributing factors included improper driving, failure to yield the right-of-way, following too closely, disregard of traffic control, driving left of center, improper passing, improper start/stop, physical impairment, and other human factors.
- Delay was identified as being pronounced at Route 4 in Alfred and Exit 4 in Biddeford.
- LOS was assessed at various locations, with poor LOS noted at:
 - From Route 111 at Shaw's to Home Depot (LOS D – Future F).
 - From Home Depot to Route 224 (LOS E – Future E/F).
- Unsignalized minor approach (to Route 111) LOS has several locations at D, E and F including (New/Old Alfred, Hill, Day/Kennebunk Pond, and Kennebunk).
- Existing signal at Exit 4 intersection with Route 111 was reported as LOS E AM /F PM.
- Future signals issue at Exit 4 (LOS F AM/F PM); Walmart/Park and Ride (E/D); Home Depot/Church (F/F); Route 35 (D/E); Route 4/202 (D/F).

Freight

- A larger percentage of traffic is trucks (>8%) in Lyman/Alfred between Route 35 and Route 4.



Transit

- No relevant discussion.

Parking

- No relevant discussion.

Nonmotorized

- No relevant discussion.

Study Recommendations

The study recommended and prioritized (near-term high, medium, low; or long-term) a number of actions on the Route 111 corridor.

In addition, the study notes that MaineDOT took immediate action on a number of items, including:

- Improved signage at several locations.
- Performed tree trimming in Sanford and Lyman to improve sight distance.
- Rechannelized Exit 32 (Maine Turnpike) at Precourt Street in Biddeford (this intersection has subsequently been expanded).
- Made minor modifications to traffic signal timing and upgraded lamps to LED, which will last considerably longer.
- Reduced the posted speed limit from 55 mph to 45 mph approaching the Route 35 intersection in Lyman.

Many of the study recommendations have since been implemented, including all that were identified as high priority short-term improvements:

- Congestion issues identified in that study were concentrated in Biddeford, especially near Exit 32. These have since been addressed by expanding the intersection of Route 111 at Exit 32 to its current configuration and upgrading the traffic signal equipment at this location. In addition, Route 111 has been widened to four lanes (plus center turn lane) from east of Andrews Road to Exit 32. Though not a specific recommendation of the prior study, this expansion was implemented to address rapid commercial growth along the corridor.
- Intersection improvements at Route 35 in Lyman and Route 202/4 in Alfred that added left turn lanes on Route 111 and implemented access management to eliminate left turns approaching the intersection zone, except at the intersection itself.

Two of the medium priority short-term improvements have also been constructed:

- Traffic signals on Route 111 between Alfred and Biddeford have been upgraded to improve visibility when the rising or setting sun interferes with drivers' line of sight. Additional traffic signal heads were mounted low and to the right side of the other signal heads.
- Intersection improvements at the Route 224/Grammar Road intersection that added left turn lanes on Route 202 and improved intersection alignment and vertical curves have been constructed.

Another medium priority short-term recommendation involved minor realignment and channelization improvements at Hill Road, including the addition of a right turn lane from westbound Route 111 to Hill Road. These improvements are programmed for construction in 2012 as MaineDOT project 017239.00.

Intersection improvements at Kennebunk Pond/Day Road were also identified as a medium priority short-term recommendation. The study notes that the original proposal to reconstruct the intersection with left turn pockets on Route 111 has not been pursued due to relatively low benefit-cost compared to other priorities. Installation of a flashing beacon at the intersection was instead recommended as a lower-cost solution.

Two low priority short-term recommendations were identified; improvements to the intersection of Route 111 and New Road/Old Alfred Road in Lyman, and realignment of the Route 111 intersections with Saco Road and School Street in Alfred. Because they were classified as lower priorities, the study recommended that they be considered as part of any future rehabilitation of the corridor, but not necessarily as stand-alone projects. However, MaineDOT has since initiated project 019002.00, which will reconstruct the intersection of New Road and Old Alfred Road to form two "T intersections" rather than the existing three-way "K-shaped" intersection (construction estimated in 2013).

To address vehicle platooning and improve safety for passing vehicles, the Route 111 study also recommended adding passing lanes along the corridor as longer-term projects. Eastbound, two one-mile passing lane segments were suggested:

- A one-mile eastbound passing lane in Alfred approximately between Drown/Clark/Blueberry Road and Graves Road.
- A one-mile eastbound passing lane in Lyman between Route 35 and Thompson/Trout Brook Road.

Neither of the eastbound passing lanes have been constructed or programmed for construction.

Westbound, two half-mile passing lanes were recommended between Route 35 and Exit 32 in Biddeford due to constraints limiting opportunities to construct a longer one-mile segment. These were located in Arundel between Old Alfred Road and Drew's Mill Road, and in Biddeford from Home Depot to Andrews Road. The Biddeford segment has since been reconstructed as a divided, four-lane highway, while the Arundel segment is programmed for construction in 2013 as MaineDOT project 019107.00. In addition, a one-mile long segment was recommended extending west from Route 35 in Lyman. This passing lane has not yet been constructed or programmed for construction.

Additional Observations by Reviewer

Public/stakeholders suggested access management as well, but the study did not make recommendations in this area.



OTHER MAINE DOT AND MTA PLANS AND STUDIES

MAINE DOT PLANS

CONNECTING MAINE – STATEWIDE LONG RANGE TRANSPORTATION PLAN 2008-2030 (JULY 2010)

The Statewide Long Range Transportation Plan (LRTP) sets the policy direction for the State and its regions with input from the transportation stakeholders. Improving safety, preserving mobility, managing access, and expanding transit are recurring themes represented within the regions that correspond to the CYCCS study area.

While *Connecting Maine* does not include any specific Capital Projects in the CYCCS study area, it does identify several recommendations for further planning and study. Those that are particularly applicable to the CYCCS include:

- Creating of Master Plans for the areas surrounding Interstate and Turnpike exits. These would involve integrated planning of transportation and land use and include binding agreements between interested parties (MaineDOT, MTA, regional planning agencies, local communities, and other stakeholders as necessary). Exit 32 in Biddeford was specifically identified as a higher priority.
- Western expansion of a limited access highway connecting the Maine Turnpike and Sanford.
- Bypasses around village centers, including North Berwick (Route 4).
- Establishment of transit service between Sanford/Biddeford.
- Right of Way, negative easement and/or access rights purchases along key corridors to acquire land for expansion of greater control of access. Routes 4, 111 and 109 were identified as candidate corridors.
- Public Park and Ride development in Sanford.

Expansion of limited access highways to the Sanford area and bypasses around town centers are two concepts that have been identified for investigation during Phase II of the CYCCS. Initial investigation of transit and access management strategies has also been initiated as well.

Goals for the Southern Maine Economic Development District

The plan identifies several goals for the Southern Maine Economic Development District, which encompasses the CYCCS study area, the remainder of York County, and the greater Portland area:

- Implement the Interstate Exit Master Plan, and I-295 mobility and safety improvements.
- Expand transit service at multiple locations.
- Improve Port of Portland marine facilities.
- Improve the Portland International Jetport.
- Conduct alternatives analyses for east-west transportation from the Maine Turnpike to the Sanford area and north-south travel in the village area of South Berwick.

The district is further subdivided into a series of broad corridors, three of which traverse the CYCCS study area and are summarized below.

Southern Coastal Corridor

The Southern Maine Economic Development District *Southern Coastal Corridor* was ranked as the top regional priority (out of six corridors). This corridor includes the coastal area of the CYCCS. Objectives included the following:

Transportation Objectives:

- Implement safety and congestion improvements to I-95.
- Increase seasonal transportation demand management I-95, Route 1.
- Support and improve transit service opportunities.
- Support the Atlantic Shoreline transit service.
- Improve safety of the on-road Eastern Trail system and invest in off-road portions.
- Work with Downeaster to explore improving commuting service.
- Develop preferred heavy haul truck exits and routes with towns.
- Increase coordination and communication with New Hampshire.
- Increase rest area opportunities for truck freight drivers on this corridor.

Land Use Objectives:

- Work to develop master plans for I-95 interchanges.
- Develop access management plans in urban compact areas.
- Limit Route 1 Driveway and Entrance Rule permit waiver.
- Continue coordination with MaineDOT and affected communities on traffic movement permit processes.
- Encourage towns to pursue transit-oriented development, especially near existing train stations.
- Identify corridors and develop plans to encourage denser development with more open space to facilitate public transit and better land use.

Economic Objectives:

- Support trail/ bicycle/pedestrian facilities to facilitate recreational tourism.
- Continue to support train stations.
- Develop efficient transit options for train riders.
- Support marine infrastructure for tourism and working waterfronts.
- Promote business development to preserve Route 1 corridor mobility.
- Work with service centers and the Portsmouth Naval Shipyard to support commuter van and bus services.
- Consider impact fees on private developers to improve corridors for future and sustainable economic growth.

The LRTP recommendations for the Southern Coastal Corridor that are noteworthy for the CYCCS include:



Policy Recommendations

- Evaluate requests for additional capacity and new Turnpike Access for communities along the southern coast.
- Reconstruct Maine Turnpike Infrastructure to support overlimit commercial vehicles.

Planning Recommendations

- Develop a Transportation Redundancy Plan.
- Expansion and development of Freight Rest Area Facilities to accommodate an expected doubling of truck traffic by 2025.
- Further develop an off-road Eastern Trail.

Southern Maine Central Corridor

The Southern Maine Economic Development District *Southern Maine Central Corridor* was ranked as the fourth highest priority in the region (out of six corridors). This area includes the central portions of York County in the CYCCS study, including the US 4 and Route 111 corridors. Objectives for this area included:

Transportation Objectives:

- Preserve mobility on Route 202.
- Monitor heavy truck movements and volumes.
- Explore commuter transit service for Route 236.
- Improve safety on US 202, and Routes 4 and 236.
- Improve interconnecting corridor intersections.
- Build park-n-ride lot for Sanford area commuters.

Land Use Objectives:

- Work with communities on land use, access management regulations to preserve mobility and improve safety.
- Develop infrastructure nodes in town centers.
- Develop transportation-land use strategies for north-south mobility in downtown South Berwick.
- Strengthen Route 236 corridor access management.
- Reduce Driveway and Entrance Rule waivers for Routes 202, 4, 236.
- Support trail and open space planning, land purchases.

Economic Objectives:

- Balance downtown economic development goals with heavy truck through traffic.
- Explore rail freight to ease north-south truck traffic.
- Develop trail systems to support recreational tourism.
- Explore scenic highway opportunities to promote tourism.
- Support non-traditional transportation modes for commuters.
- Monitor and assess heavy truck impacts of resource extractive industries.

The LRTP recommendations for the *Southern Maine Central Corridor* that are noteworthy for the CYCCS include:

Policy Recommendations

- Reconstruct Maine Turnpike Infrastructure to support overlimit (height/weight) commercial vehicles.
- Stepped up planning for use of public infrastructure by Resource Extraction Industry (e.g. – coordinated policies addressing road damage, routing, noise, etc.).

Planning Recommendations

- Bypasses around village centers in North Berwick and South Berwick (US 4 and Route 236).
- Right of Way, negative easement and and/or access rights purchases. Routes 236, US 4 and US 202 identified as candidate corridors.
- Commuter transit feasibility studies to serve large employers in the Route 236/US 4 area (Pratt and Whitney, Portsmouth Naval Shipyard, etc.).
- Public Park and Ride development in Sanford.

York County East-West Corridor

The Southern Maine Economic Development District *York County East-West Corridor* was ranked as the sixth highest regional priority (out of six corridors). This area includes the central portions of York County in our study, and focuses on improving connections from northern York County to the Kittery area. Objectives for this area included:

Transportation Objectives:

- Continue to support Routes 109, 111 corridor committee planning efforts.
- Study commuter transit for Routes 109, 111.
- Build Park and Ride lot near Sanford for Route 111/202 commuters and Route 4, US 202 on Southern Maine Central Corridor System.
- Safety improvements to Routes 109, 111, 25.
- Work with police to improve highway safety.
- Monitor heavy truck traffic increases on Routes 109, 111, 112.

Land Use Objectives:

- Work with towns to improve access management.
- Provide technical support to towns to improve mobility by planning for new local roads, frontage roads and rear access drives.
- Purchase control of access to protect significant corridors where feasible.

Economic Objectives:

- Leverage impact fees from private developers to improve corridors for sustainable growth.
- Develop local commercial and industrial zoning standards for east-west highway mobility corridors consistent with MaineDOT's access management guidelines.
- Pursue legislation to expand review of economic and mobility impacts on developments of regional, cumulative regional significance.



- Develop transportation demand management strategies for interior York County towns to coastal service centers.

The LRTP recommendations for the *York County East-West Corridor* that are noteworthy for the CYCCS include:

Planning Recommendations

- Interstate Exit Master Plans with Capital Improvement Plan components and agreements between agencies and stakeholders on actions and commitments. Biddeford exit 32 identified as a higher priority.
- Western expansion of MTA tolled, limited access highway network (e.g. – to Sanford).
- Establish transit service between Sanford/Biddeford.
- Right of Way, negative easement and/or access rights purchases. Routes 111 and 109 identified as candidate corridors.
- Public Park and Ride development in Sanford.

CONNECTING MAINE – MULTIMODAL SIX-YEAR TRANSPORTATION CAPITAL IMPROVEMENT PROGRAM FY 2010-2015 (APRIL 2009)

This is the six year capital improvement plan that supports the policies laid out in the Long Range Plan. This Plan lists major transportation projects and initiatives that MaineDOT intends to fund over the next six years, assuming adequate funding. It also provides potential strategic investment levels based on the Long Range Plan if additional funding becomes available. The plan provides a list of projects by town for the next six years (York County begins on Page 87). Projects of possible interest to the CYCCS are:

- Arundel: Route 111 safety improvements (Old Alfred Road to Drews Mill Road).
- Biddeford: Route 1 reconstruction (Grayson St to Beaudoin Ave).
- Kennebunk: Route 1 Kennebunk Bridge replacement.
- Kennebunk: Route 9 Clayhill Bridge replacement.
- Kennebunk: Route 35 reconstruction (Alfred Rd to near Kimball Lane).
- Lyman: Route 111 miscellaneous safety improvements (Route 35 to Back Road), including 1-mile long westbound passing lane.
- Lyman/Alfred: Route 111 safety improvements (Blueberry Rd to Graves Rd).
- Ogunquit/Wells: Route 1 Donnell's Bridge replacement.
- Wells: Route 109 highway reconstruction (Maine Turnpike Wells interchange, extending 2.3 miles northerly).

FISCAL YEAR 2010-2011 CAPITAL WORK PLAN (UPDATED SEPT 2009)

The *MaineDOT 2010-2011 Capital Work Plan* summarizes the department's design and construction work program for the current biennium. This updated plan reflects current volatility in State and Federal funding, and thus includes fewer commitments than the original plan issued in April 2009. Projects within the CYCCS study area are summarized in Table 4.

Table 4: CYCCS Study Area Projects Included in the 2010-2011 Capital Work Plan

Town	Location (or Type)	Description	Budget	PIN
Alfred	Back Road	Replace Nutters Bridge over Littlefield River.	\$600,000	016677.00
Arundel	Route 111 (Alfred Road) at Hill Road	Intersection improvements.	\$460,000	017239.00
Biddeford	Route 1	Route 1 reconstruction (Grayson St to Beaudoin Ave).	\$3,400,000	014814.00
Biddeford	ZOOM Bus	Purchase of buses for replacement/expansion of service.	\$333,333	017237.00
Kennebunk	West Village Area	Construct sidewalk and bicycle improvements.	\$342,000	017476.00
Kennebunk	Route 1	Replace Kennebunk Bridge over Mousam River.	\$1,350,000	015098.00
Kennebunk	Intermodal Center	Construct intermodal center to support Shoreline Explorer bus.	\$500,000	016120.00
Kennebunk ¹	Route 9	Preliminary engineering and property acquisition for future replacement of Clayhill Bridge.	\$250,000	017079.00
Kennebunk, Arundel ²	Durrells Bridge	Replace surface.	\$180,000	016706.00
Lyman	Route 111	Bridge culvert replacement.	\$190,000	01713.00
North Berwick, Berwick, South Berwick ²	Route 4	Resurfacing (beginning 0.17 miles north of Lebanon Road and extending 6.29 miles southerly).	\$1,400,000	016799.00
Ogunquit, Wells ¹	Route 1	Preliminary engineering and property acquisition for future replacement of Donnell's Bridge.	\$200,000	017080.00
Sanford	YCCAC	Bus purchases and maintenance.	\$92,985 \$96,383 \$88,557	017169.00 017157.00 017170.00
Sanford	Route 11A (Oak St) at Hanson Ridge Road	Intersection improvements (without signal).	\$210,000	017247.00
Sanford	Sanford Regional Airport	Reconstruct runway 7-25 with lighting.	\$4,950,000	017393.00
Wells	Route 109	Reconstruct highway beginning 0.15 mile north of Maine Turnpike Exit 19 and extending northerly (toward Sanford) 2.30 miles.	\$13,000,000	007998.10
Wells ²	Chapel Road	Resurfacing.	\$233,000	017064.00

¹ Preservation or property acquisition projects only.

² Resurfacing projects only.



MAINE INTEGRATED FREIGHT PLAN (2002)

This is an update to the 1998 Freight Plan to create a more advanced, state-of-the-art freight program for the State. The regional freight plan update was used to identify freight flows and issues in the state. The goals of this Plan were:

- Develop an updated freight profile for Maine reflecting changes to the freight transportation system and the evolution of the freight transportation industry.
- Build relationships with and identify the concerns of public and private freight stakeholders in the State.
- Document the progress and lessons learned since the completion of the original IFP in 1998.
- Recommend specific freight improvement projects and changes to Maine's freight planning program.

While the plan does not include recommendations specific to the CYCCS study area, general recommendations pertinent to the CYCCS include expediting improvements to the Kittery-York weigh stations on I-95 (more efficient, safer); continuing the Access Management program (conserves efficient movements on system); completing improvements similar to those on Route 9 to better accommodate trucks on US Routes 1, 2, and 302 and State Routes 4, 25, 26, 29 (Heavy Haul Truck network) and the Maine Turnpike such as adding lanes, climbing lanes, etc; increasing federal weight limits to 100,000 pounds; and adjusting permitting rules for 48 and 53 foot trailers.

MOVING PEOPLE AND GOODS; THE GOVERNOR'S RAIL AND FREIGHT INVESTMENT PLAN (2009)

This document details a plan to invest in the rail and port system to enable Maine to compete in the global marketplace. The goal is to operate efficiently and seamlessly between highway and rail, reduce wear and tear on the highways and bridges, limit transportation impacts on climate change, and increase transportation and mobility options.

The report notes that about 85% of commercial freight is shipped by truck today in Maine and advocates for improved connections between the rail system and marine and inland ports.

While the report does not identify any port or intermodal facilities within the CYCCS area, it does identify \$55 Million of AARA funding for high speed rail for the Amtrak Downeaster which provides a 146-mile rail corridor between Boston, MA and Brunswick. Part of the corridor (Portland to Boston) was rehabilitated to Class 3 and 4 standards in 2000 to support passenger service and currently operates five round trips daily. The approximate annual FY 2009 ridership is 470,000 passengers. A \$35 million project will rehabilitate approximately 30 miles of existing rail to Class 3 standards in order to support the extension of the Amtrak Downeaster intercity passenger rail service from Portland to Brunswick, with a stop in Freeport. The Downeaster Extension project will improve regional mobility, promote economic development, and expand tourism opportunities along the entire corridor from Boston through to Midcoast Maine. The rail line to be rehabilitated by this project is owned by Pan Am Railways and is one of the state's most important freight corridors. Improvements made to support passenger service will improve reliability of freight service as well. The project is fully supported by both Pan Am and Amtrak.

MAINE TURNPIKE AUTHORITY (MTA) REPORTS

MAINE'S PARK AND RIDE LOTS; EVALUATING AND STRENGTHENING THE SYSTEM (MTA/MAINEDOT, 2004)

The MTA operates three Park and Ride lots in the CYCCS study area, located adjacent to the Maine Turnpike in Biddeford, Kennebunk and Wells. ShuttleBus ZOOM Turnpike Express service operates from the Biddeford lot, while Amtrak and York County Community Action Corporation bus services (Sanford Ocean Shuttle and Shoreline Trolley) service the Wells Transportation Center. Kennebunk is a commuter rideshare only lot with no scheduled transit service.

This comprehensive evaluation of Park and Ride lots in Maine includes several findings of interest to the CYCCS:

- The Portsmouth Naval Shipyard is a major attractor of trips to Park and Ride lots.
- The Biddeford Park and Ride lot on Route 111 (then exit 4, now exit 32) was identified as approaching capacity (current usage is 74%). This lot is served by the ZOOM Turnpike Express bus service.
- The study recommended closing one of two lots in Shapleigh (located north of the CYCCS study area on Route 109).
- Improved access (intersection improvements) to the Biddeford lot is recommended.
- The possibility of incorporating church parking lots into the Park and Ride system was suggested for further study.
- Establishment of a Park and Ride lot was recommended in Sanford, or possibly at the US 4/Route 111 intersection in Alfred.
- Size and average occupancy for CYCCS study area Park and Ride lots is as follows:
 - Wells: 100 spots, 32% average occupancy.
 - Kennebunk: 52 spots, 42% average occupancy.
 - Biddeford: 155 spots, 74% average occupancy
- System-wide, carpools are the most frequent mode of transport accessed (42%), followed by vanpool (22%), transit bus (16%) and charter bus (12%). Charter buses include employer-based private bus services as well as recreational tours, though charter bus excursions are not allowed to use MTA lots.

MAINE'S PARK AND RIDE LOTS; SYSTEM UPDATE (MTA/MAINEDOT, 2007)

Key aspects of interest to the CYCCS from this update to the 2004 study are:

- Nearly 90% of Park and Ride use is for work related trips.
- Biddeford remained on this list of lots approaching capacity.
- Recommended exploring opportunities for public-private use and development.
- Updated average occupancy information for CYCCS study area Park and Ride lots is as follows:
 - Wells: 100 spots, 28% average occupancy.
 - Kennebunk: 52 spots, 40% average occupancy.



- Biddeford: 155 spots, 76% average occupancy.

MAINE TURNPIKE 10-YEAR PLANNING REPORT 2009-2018 (MTA, SEPT 2009)

This report is described as a 10-year planning tool for addressing the Turnpike and supporting transportation system within the broader corridor, and is intended for use by the MTA, MaineDOT, MPOs/Regional Councils and local communities.

The report describes existing conditions and historical trends on the Turnpike, as well as a forecast of traffic to 2018. Of interest to the CYCCS:

- Trips using the Turnpike have increased at an average rate of 5.9% annually since 1968, though growth has slowed in recent years and the number of annual trips has remained fairly constant since 2003/04.
- Annual growth in AADT since 2001 ranges from 0.0% to 0.3% within the CYCCS study area.
- The Average Annual Daily Traffic (AADT) on segments within the CYCCS study area is: 23,735 southbound (SB) and 24,168 northbound (NB) between Biddeford and Kennebunk, 22,235 SB and 22,618 NB between Kennebunk and Wells, and 21,261 SB and 21,623 NB between Wells and York.
- Design hour traffic volumes (30th highest hourly volume experienced over the course of a year) have increased at higher rates than AADT, average 1.59% increase in the southern regions of the Turnpike.
- Current Design Hour Level of Service is LOS B to C in the CYCCS study area, and is forecast to remain at LOS C through 2018.

The report identifies projects planned over the 10-year timeframe (by MTA or other agencies). Within the CYCCS study area, these include a number of pavement rehabilitation projects as well as the following:

- Potential capacity expansion to the exit 32 Park and Ride in Biddeford.
- Eastern Trail Bridge (planned for 2010 and currently under construction).
- Additional truck parking and possible truck stop electrification improvements (est. 2016).

The CYCCS and renovation/possible relocation of the York Toll Plaza are both identified as near-term studies. A range of Intelligent Transportation Systems upgrades are identified (variable message signs, automatic traffic counter stations, and travel advisory radio).

Existing transit services and travel demand management/travel information programs are described. The report notes that ridership on ZOOM has increased sharply in 2007 and 2008 (from some 20,000 annual riders in 2007 to over 46,000 in 2009). Reported Park and Ride utilization for 2005 through 2008 shows available capacity at all MTA lots; Wells (28% to 54% occupied), Kennebunk (37% to 50%) and Biddeford (63% to 77%).

2010 ORIGIN DESTINATION SURVEY SUMMARY REPORT (2010)

The MTA conducted a detailed origin-destination survey of Maine Turnpike users during the summer of 2010. The study was undertaken to update data on travel patterns, develop a better understanding of user characteristics, and develop a better understanding of the potential effects of open road tolling on user payment choice (e.g. – switching to E-ZPass toll transponders, rather than paying cash fare). The survey methodology involved distribution of survey cards at Turnpike interchanges. A 21 percent response rate yielded a statistical confidence level of 95 percent, with an estimated margin of error of +/- 5 percent. Key findings included:

- 75 percent of respondents were Maine residents.
- Turnpike users who are Maine residents use the Turnpike on average about four times per week. More than half of all Turnpike users use the Turnpike at least weekly.
- Average vehicle occupancy was 1.90.
- Work related trips constituted nearly half of weekday trips. The report notes however that work trips may actually have a higher share because survey cards were not distributed during peak hours to avoid creating traffic delays.
- Just over two-thirds of respondents have E-ZPass responders, and one-third of cash patrons indicated they would acquire an E-ZPass if open road tolling were implemented at the mainline plazas.
- At the York Toll Plaza, a smaller share of respondents was Maine residents (40 percent) than system-wide. Nearly 64 percent of respondents only travel through the York Toll Plaza “a few times per year”.
- The study estimates that an east-west connector in Central York County could serve up to 6,350 trips per day seeking to connect to the Maine Turnpike. This rough estimate was computed based on current interchange AADTs and the share of respondents who identified that they were traveling to a destination within the CYCCS study area.
- The study identified the follow share of interchange users destined for locations in the CYCCS study area:
 - Exit 19 Wells: 7.9 percent.
 - Exit 25 Kennebunk: 9.7 percent.
 - Exit 32: 19.5 percent.

MAINE TURNPIKE AUTHORITY 2007 ANNUAL REPORT OF OPERATION AND MAINTENANCE (MTA, 2007)

This report presents a thorough, detailed inventory and assessment of MTA infrastructure and assets.

MAINE TURNPIKE AUTHORITY 2009 ANNUAL REPORT (MTA, 2009)

The MTA's annual report describes construction, maintenance, operating and financial activities. Replacement of the current York Toll Plaza, including addition of “open road” tolling is described as a high priority.



YORK TOLL PLAZA REPLACEMENT STUDY (MTA, 2008)

This study evaluated options for replacing the existing Turnpike toll plaza in York, located to the southwest of the CYCCS study area. The study considered five options that ranged from status quo to upgrading the plaza at its current location to constructing a new plaza elsewhere with high speed tolling capabilities (recommended approach). The specific location for the proposed relocation of the toll plaza is to be determined.

The study also briefly summarizes the Toll Diversion investigation noted below. The study conducted an interview survey that indicated that about 2% to 3% of the traffic that would use the Turnpike if no tolls were charged instead would divert to other routes as a result of tolls. This equates to fewer than 2,000 vehicles daily, with the majority diverting to Route 1 and some diverting to US 4/Route 236 and other routes. A corresponding license plate survey on Route 1 indicated consistent results, with an estimated 0.7% to 1.6% of would be Turnpike traffic diverting to Route 1 to avoid the York tolls.

OTHER STUDIES OF INTEREST

STUDY OF IMPACTS CAUSED BY EXEMPTING CURRENTLY NON-EXEMPTING MAINE INTERSTATE HIGHWAYS FROM FEDERAL TRUCK WEIGHT LIMITS (MAINEDOT, JUNE 2004)

This study evaluated the potential safety, cost, social and economic impacts of exempting all non-exempt Interstate Highways in Maine from the 80,000 pound gross vehicle weight limit for trucks. Because the Maine Turnpike is exempt from Federal Interstate Highway weight restrictions, the study focused on I-295 and I-95 north of Augusta. As a result, no potential effect on truck volumes in the CYCCS study area was identified.

STUDY OF IMPACTS CAUSED BY EXEMPTING THE MAINE TURNPIKE AND NEW HAMPSHIRE TURNPIKE FROM FEDERAL TRUCK WEIGHT LIMITS (MAINEDOT, JUNE 2004)

Conducted in coordination with the prior study, this effort looked at impacts associated with the existing practice of exempting the Maine Turnpike and New Hampshire (Spaulding) Turnpike from federal truck weight limits. The study concluded that higher weight limits on the Maine Turnpike kept more than 30 higher-weight (80,000 to 100,000 lbs) daily truck trips off of many parallel state highway segments, including US 202, US 4, and portions of Route 1. Route 111 was also identified as benefiting from fewer heavy truck trips, though to a lesser degree than the other identified routes. The study further quantified safety and maintenance benefits associated with such actions.

ROUTE 236 CORRIDOR COMMITTEE (SMRPC, 2004-07)

The SMRPC organized a committee comprising the towns of Kittery, Eliot, and South Berwick, MainedOT, the MTA, and others to focus efforts with regard to study of the Route 236 corridor. The study process resulted in production of a number of documents, some of which are of interest to the CYCCS:

- *A Summary of Land Use and Transportation Regulations/Policies Impacting Route 236* includes detailed information regarding zoning and access management regulations for communities along Route 236. Some of these practices could be candidates for consideration in the CYCCS communities, such as:
 - Eliot empowers the Planning Board to specify roadway dimensional standards and provision of access streets as needed to assure free flow of traffic. Planning Board may also restrict access from individual lots onto arterial streets. Street layout requirements prohibit more than one entrance onto an arterial per 1,000 feet of street frontage. Eliot's comprehensive plan encourages grouping of commercial activity.
 - Kittery's Planning Board may require marginal access streets, reverse frontage or similar treatments for any development abutting or containing an existing or proposed arterial. Entrances onto arterials or secondary arterials are limited to one per 1,000 feet of street frontage. Kittery's design provisions encourage circulation driveways connecting adjacent lots.

- South Berwick prohibits more than two driveway openings on the same street from an off-street parking area. The Planning Board is given discretion to encourage use of common driveways for planned unit developments and cluster developments.
- An *Action Plan*, which among its recommendations includes the following:
 - Address physical and regulatory issues that may discourage overlimit trucks from the Turnpike.
 - Coordinate and strengthen access management.
 - Support South Berwick in achieving through-traffic routing alternatives.
 - Investigate impact free program potential and impacts.
 - Investigate contract zoning and overlay zoning as means to maintain mobility and improve safety.
- Data showing municipalities with more than 50 employees at the Naval Shipyard (Sanford/Springvale – 347, Biddeford – 201, Wells – 158, North Berwick -137, Kennebunk – 66, Lyman – 54).
- A 2006 presentation summarizing Route 236 Corridor Study findings:
 - Pronounced directional commute (toward Kittery/Portsmouth in the morning).
 - Slower travel speeds through South Berwick (under 25 mph).

TRANSPORTATION IMPACTS OF SMART GROWTH DEVELOPMENT IN MAINE (UNIVERSITY OF VERMONT TRANSPORTATION RESEARCH CENTER, 2009)

A 2009 study by the Transportation Research Center at the University of Vermont considered the impacts of “Smart Growth” strategies on travel characteristics, including daily vehicle miles traveled (VMT), greenhouse gas emissions, and average trip length in the towns of Sanford and Lisbon, Maine. Smart Growth strategies are those land use actions that concentrate development in locations well-served by transportation and other public works infrastructure and cluster complementary uses, in-part in an effort to reduce trip making. The analysis was conducted using a travel demand model to quantify the degree these measures could be affected by land use changes.

For purposes of this review, the findings related to Sanford are summarized. Three alternative growth scenarios were evaluated:

- A Status Quo Growth scenario that presumed continued historic land use patterns.
- A Targeted Smart Growth strategy that redirected a portion of projected household and employment growth into a dense, mixed-use infill development accompanied by an urban growth boundary.
- A Multiple Smart Growth strategy that redirected a greater share of projected growth into three mixed-use, infill areas in Sanford.

The study held constant for all scenarios the total amount of growth projected, household characteristics, and transit mode share, meaning that the affect of the smart growth strategies on the number of automobile trips was not captured; only those effects related to change in trip length and travel patterns were identified.



In general, the study concluded:

- “Slight” but observable reduction in VMT, trip length and resulting greenhouse gases for Smart Growth strategies relative to the Status Quo Growth scenario, with the Multiple Smart Growth strategy conveying more benefit than the Targeted Smart Growth strategy. VMT reductions were 0.27% (Multiple Smart Growth) and 0.24% (Targeted Smart Growth), while emissions were reduced by 0.43% and 0.42% for the two respective strategies.
- Changes in VMT were not uniform; some roads experienced increased travel and others showed reduced travel. Route-specific changes in travel should be considered in planning Smart Growth developments.
- Directing even more growth into Smart Growth development could result in greater benefits than reported.
- The role of integrating transit improvements with Smart Growth strategies was not investigated or accounted for, and could also lead to greater benefits than reported in the study.